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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,641	11/24/2003	Hiroshi Fukuhara	F58-159665M/MTV	1197

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EXAMINER	
LEUNG, JENNIFER A	
ART UNIT	**PAPER NUMBER**
1764	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/07/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/718,641	FUKUHARA, HIROSHI	
	Examiner	Art Unit	
	Jennifer A. Leung	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 November 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) *1-9* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-21* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 March 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3-18-05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group II, claims 10-21, in the reply filed on November 13, 2006 is acknowledged. Group I, claims 1-10, is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

152 (see FIGs. 1, 3 and 4)

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities:

On page 7, line 1:

"micromist filter 102" should be changed to --micromist filter 30--.

On page 18, line 10, and on page 20, lines 14 and 15:

"PAS" should be changed to --PSA--.

Appropriate correction is required.

5. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

6. Claims 16 and 19 are objected to because of the following informalities:

In claim 16, line 3, and in claim 19, lines 2-3 and 4:

"the hollow chamber membrane" should be changed to --the hollow fiber membrane--, for consistency in claim terminology, as set forth in claim 15.

In claim 19, line 3:

"the compressed chamber" should be changed to --the compressed air--, to correct for a typographical error.

Appropriate correction is required.

Claim Rejections - 35 USC § 102 and § 103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 10-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Prasad (US 4,931,070).

Regarding claim 10, as best understood, Prasad (FIG. 1; column 4, lines 5-22) discloses an apparatus comprising: an air compressor **2** and a deoxidizing chamber (i.e., a deoxo unit **9**). The recitations with respect to the iron powder have not been given patentable weight, since it does not appear that the iron powder is being positively recited as an element of the apparatus.

Regarding claims 11 and 12, the language of the claims is directed to a process limitation (i.e., a step of adding catalyst) that provides no further patentable weight to the apparatus claims. It is noted that the catalyst is not positively recited as an element of the apparatus. Thus, the apparatus of Prasad meets the claims.

Regarding claim 13, the language of the claim is directed to a process limitation (i.e., a step of adding water) that provides no further patentable weight to the apparatus claim. In addition, the water is merely a material worked upon by the apparatus. Thus, the apparatus of Prasad structurally meets the claims.

Regarding claim 14, the language of the claim is directed to a process limitation (i.e., a step of adding a moisture retaining material) that provides no further patentable weight to the

apparatus claim. It is noted that the moisture retaining material is not being positively recited as an element of the apparatus. Thus, the apparatus of Prasad structurally meets the claims.

Regarding claim 15, the apparatus further comprises a hollow fiber membrane (i.e., the membrane of air separation unit **4** or **7**; see column 8, line 61 to column 9, line 9).

Instant claims 10-15 structurally read on the apparatus of Prasad.

8. Claims 10-14 are rejected under 35 U.S.C. 102(b) as anticipated by Sperberg (US 3,370,915), or, in the alternative, under 35 U.S.C. 103(a) as obvious over Sperberg (US 3,370,915) in view of Sperberg (US 3,498,343).

Regarding claim 10, Sperberg '915 discloses an apparatus comprising: a deoxidizing chamber (i.e., the air chamber of a pneumatic tire) to which compressed air is supplied (see column 1, lines 24-39). As best understood, the recitations with respect to the iron powder add no further patentable weight, since it does not appear that the iron powder is being positively recited as an element of the apparatus. In any event, Sperberg '915 further discloses that iron powder may be provided in the deoxidizing chamber, wherein the compressed air reacts with the iron powder to form iron oxide (see column 1, line 59 to column 2, line 9; Example 3; column 3, line 22 to column 4, line 35; claim 10). In addition, although Sperberg does not specifically state the provision of a compressor for generating the compressed air to be fed to the pneumatic tire, it would have been obvious for one of ordinary skill in the art at the time the invention was made to provide a compressor to the apparatus of Sperberg '915, if not already inherent therein, for supplying the compressed air to the pneumatic tire, because a compressor is a well known and conventional means used for supplying compressed air to pneumatic tires, as evidenced by Sperberg '343 (e.g., compressor **10**, FIG. 1; column 2, lines 56-65).

Regarding claims 11 and 12, the language of the claims is directed to a process limitation (i.e., a step of adding catalyst) that provides no further patentable weight to the apparatus claims. It is noted that the catalyst is not positively recited as an element of the apparatus. Thus, the apparatus (or the modified apparatus) of Sperberg '915 structurally meets the claims.

Regarding claim 13, the language of the claim is directed to a process limitation (i.e., a step of adding water) that provides no further patentable weight to the apparatus claim. In addition, the water is merely a material worked upon by the apparatus. Thus, the apparatus (or the modified apparatus) of Sperberg '915 structurally meets the claims.

Regarding claim 14, the language of the claim is directed to a process limitation (i.e., a step of adding a moisture retaining material) that provides no further patentable weight to the apparatus claim. It is noted that the moisture retaining material is not being positively recited as an element of the apparatus. Thus, the apparatus (or the modified apparatus) of Sperberg '915 structurally meets the claims.

9. Claims 10-16 and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barbe (FR 2 722 114) in view of Matsubara (JP 2001-314727).

Regarding claims 10, 15 and 16, Barbe (see FIG. 1 and machine translation) discloses an apparatus comprising: a compressor **1** for generating compressed air; a heat exchanger **7** for heating the compressed air; and a hollow fiber membrane **9** through which the heated compressed air is passed. Barbe, however, is silent as to the provision of a deoxidizing chamber, downstream of the hollow fiber membrane **9**.

Matsubara (FIG. 1-3; machine translation) teaches a deoxidizing chamber **11** provided with an easily oxidizable ingredient **17**, such as iron powder (see Abstract, section [0018]). The

deoxidizing chamber **11** may be used in combination with conventionally known apparatuses for removing oxygen from nitrogen gas, such as hollow fiber membranes (see section [0024]). Matsubara further illustrates a suitable configuration wherein the deoxidizing chamber **11** is provided downstream of a hollow fiber membrane **33** (see FIG. 3).

It would have been obvious for one of ordinary skill in the art at the time the invention was made to provide the deoxidizing chamber as taught by Matsubara at a location downstream from the hollow fiber membrane **9** in the apparatus of Barbe, on the basis of suitability for the intended use thereof, because the deoxidizing chamber further reduces the oxygen content of the nitrogen gas to thereby produce a nitrogen gas of an even higher purity, when used in combination with the prior art nitrogen purification apparatuses, as taught by Matsubara (see section [0028]).

Regarding claims 11 and 12, the language of the claims is directed to a process limitation (i.e., a step of adding catalyst) that provides no further patentable weight to the apparatus claims. It is noted that the catalyst is not positively recited as an element of the apparatus. Thus, the modified apparatus Barbe meets the claims.

Regarding claim 13, the language of the claim is directed to a process limitation (i.e., a step of adding water) that provides no further patentable weight to the apparatus claim. In addition, the water is merely a material worked upon by the apparatus. Thus, the modified apparatus of Barbe meets the claims.

Regarding claim 14, the language of the claim is directed to a process limitation (i.e., a step of adding a moisture retaining material) that provides no further patentable weight to the apparatus claim. It is noted that the moisture retaining material is not being positively recited as

an element of the apparatus. Thus, the modified apparatus of Barbe meets the claims.

Regarding claims 10, 18 and 21, Barbe (see FIG. 1 and machine translation) discloses an apparatus comprising: a compressor **1** generating compressed air; and a nitrogen gas generator (i.e., PSA absorbers **A,B**), wherein the nitrogen gas generator comprises a first oxygen absorbing tank **A**; a first throttle valve, operable to adjust a flow rate of the compressed air passing through the first absorbing tank **A** (i.e., see valves, drawn but not labeled, surrounding tank **A** in FIG. 1); a second oxygen absorbing tank **B**; and a second throttle valve, operable to adjust a flow rate of the compressed air passing through the second oxygen absorbing tank **B** (i.e., see valves, illustrated but not labeled, surrounding tank **B** in FIG. 1). Barbe, however, is silent as to the provision of a deoxidizing chamber, downstream of the nitrogen generator **A**, **B**.

Matsubara (FIG. 1-3; machine translation) teaches a deoxidizing chamber **11** provided with an easily oxidizable ingredient **17**, such as iron powder (see Abstract, section [0018]). The deoxidizing chamber **11** may be added in combination with and downstream from conventionally known apparatuses for removing oxygen from a nitrogen stream, such as an apparatus employing PSA (see section [0024]).

It would have been obvious for one of ordinary skill in the art at the time the invention was made to provide the deoxidizing chamber as taught by Matsubara at a location downstream from the nitrogen gas generator **A,B** in the apparatus of Barbe, on the basis of suitability for the intended use thereof, because the deoxidizing chamber further reduces the oxygen content of the nitrogen gas to thereby produce a nitrogen gas of an even higher purity, when used in combination with the prior art nitrogen purification apparatuses, as taught by Matsubara (see section [0028]).

Regarding claim 19, Barbe further discloses a throttle valve (i.e., valve **19**; FIG. 1), arranged at an immediate downstream of the hollow fiber membrane **9**, operable to adjust a flow rate of the compressed air passing through the hollow fiber membrane **9**.

Regarding claim 20, Barbe further discloses a filter (e.g., filters **3**, **5**; FIG. 1).

10. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barbe (FR 2 722 114) in view of Matsubara (JP 2001-314727), as applied to claims 10 and 15 above, and further in view of Caskey et al. (US 4,929,259).

Barbe is silent as to the hollow fiber membrane **9** being comprised of polyimide. Caskey et al. teaches a hollow fiber membrane **10** (FIG. 1; column 12, lines 39-48), wherein it is preferable to use a membrane comprised of, for example, a polyimide, in the separation of gases (See column 4, lines 22-62; specifically, column 4, lines 49-53. See also column 3, lines 40-43 for examples of gases). It would have been obvious for one of ordinary skill in the art at the time the invention was made to select a polyimide hollow fiber membrane for the hollow fiber membrane **9** in the modified apparatus of Barbe, on the basis of suitability for the intended use thereof, because the use of polyimide hollow fiber membranes is preferred for the separation of gases, such as oxygen from nitrogen, as taught by Caskey et al.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is (571) 272-1449. The examiner can normally be reached on 9:30 am - 5:30 pm Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jennifer A. Leung Jennifer Leung
February 2, 2007